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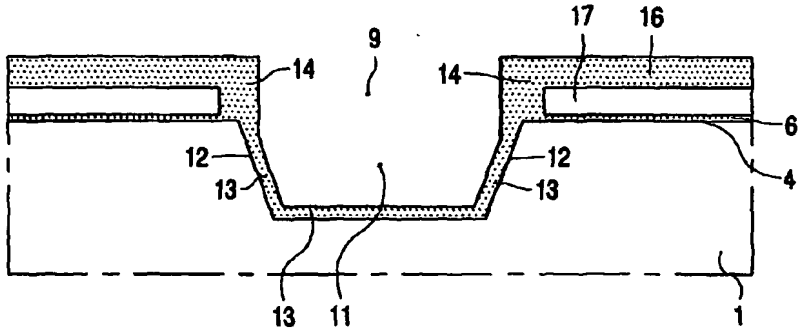
(54) Title: METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE WITH FIELD ISOLATION REGIONS CONSISTING OF GROOVES FILLED WITH ISOLATING MATERIAL



(57) Abstract: A method of manufacturing a semiconductor device comprising a silicon body (1) having a surface (4) provided with field isolation regions (2) enclosing active regions (3). In this method, on the surface of the silicon body there is formed an auxiliary layer (5) of a material on which, during an oxidation treatment, a thicker layer of silicon oxide is formed than on the silicon of the silicon body. Here, an auxiliary layer comprising silicon and germanium is formed on the surface, said auxiliary layer preferably being a layer of SixGe1-x-yCy, where $0.70 < x < 0.95$ and $y < 0.05$. Next, at the location of the field isolation regions to be formed, windows (9) are formed in the auxiliary layer and trenches (11) are formed in the silicon body. Next, on the walls (12) of the trenches, a silicon oxide layer (13) is provided and on the walls (10) of the windows a silicon oxide layer (14) is provided, both being formed by an oxidation treatment. The auxiliary layer is not oxidized throughout its thickness. After the oxidation treatment, a layer of insulating material (18) is deposited which fills the trenches and windows completely. Then, successively, a planarization treatment is carried out until the non-oxidized part of the auxiliary layer (17) is exposed, and the exposed part of the auxiliary layer is removed. Thus, field isolation regions (2) are formed having an edge (19) extending above the active regions (3).

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